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EXAMINER

ELEY, TIMOTHY V

ART UNIT

PAPER NUMBER

3724

DATE MAILED: 04/07/2004

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/085,747

Applicant(s)

SATO ET AL.

Examiner

Timothy V Eley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

2. The disclosure is objected to because of the following informalities:

a. "(a)fter . . . therefrom"(page 31, lines 21-23) is awkwardly worded.

b. Numeral "22"(page 33, line 26) is not seen in the drawing. Perhaps it should be --23--.

Appropriate correction is required.

Claim Objections

3. Claims 1-20 are objected to because of the following informalities:

a. "said second electrode . . . machined(claim 1, lines 12 and 13) is awkwardly worded. The surface to be machined was not previously recited as having an electrode.

b. "a rectangular pulse . . . electrode"(claim 16, lines 3 and 4) is awkwardly worded.

Appropriate correction is required.

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Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C.

112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 6, 19, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. "said wiping surface" (claim 6, line 3), and "said temperature" (claim 19, line 3) both lack proper antecedent basis since they were not properly earlier referred to.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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7. Claims 1-3, and 7-11 are rejected under 35 U.S.C. 102(a) as being anticipated by Talieh(6176992).

a. Talieh discloses an electro-chemical machining apparatus in the embodiment of figure 2, the apparatus comprising; inherently a holding means for holding the object to be machined; a wiper 32 for wiping the surface of the object to be machined; a supplying means for supplying electrolytic solution onto the surface of the object to be machined; a first electrode(attached to the anode 30) disposed in a position opposed to the surface to be machined; a second electrode(attached to the cathode 28) disposed at a peripheral portion of the surface to be machined; and a power supply for supplying electrical current between the second electrode and the first electrode. See column 5, lines 32-52.

b. Regarding claims 2 and 3, the object to be machined has a metal film on a surface, the metal film comprising at least one element selected from the group consisting of copper, aluminum, tungsten, gold, silver and any alloy, oxide or nitride of the metals. See column 1, lines 13-23.

c. Regarding claims 7 and 8, the wiper comprises a resilient material which is porous polyurethane inherently provided with venting holes. See column 4, lines 33-37.

d. Regarding claim 9, the wiper 1, further comprises a wiper support member for supporting the wiper, wherein said support member is provided with venting holes. See figure 2.

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e. Regarding claim 10, the wiper is rotatably provided on a rotary axis. See figure 2.

f. Regarding claim 11, the means for supplying electrolytic solution supplies electrolytic solution including an electrolyte and an additive. See column 4, lines 42-44.

8. Claims 1-8,10,11, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Doan(6,582,281) et al.

a. Doan et al discloses an electro-chemical machining apparatus in the embodiments of figures 1 and 4, the apparatus comprising; a holding means for holding the object to be machined; a wiper(22,22a) for wiping the surface of the object to be machined; a supplying means for supplying electrolytic solution onto the surface of the object to be machined; a first electrode(attached to the wiper) disposed in a position opposed to the surface to be machined; a second electrode(attached to the object) disposed at a peripheral portion of the surface to be machined; and a power supply for supplying electrical current between the second electrode and the first electrode. See figures 1 and 4; column 3, lines 16-48; column 5, lines 29-47 and lines 55-end.

b. Regarding claims 2 and 3, the object to be machined has a metal film on a surface, the metal film comprising at least one element selected from the group consisting of copper, aluminum, tungsten, gold, silver and any alloy, oxide or nitride of the metals. See column 1, lines 14-18.

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c. Regarding claim 4, the holding means rotates the object to be machined around a rotary axis. See column 3, lines 65-end to column 4, lines 1-4.

d. Regarding claim 5, the holding means applies a pressure (as broadly recited by applicant since it is in contact with the object) onto the object to be machined and rotates the object to be machined around the rotary axis. See column 3, lines 65-end to column 4, lines 1-4.

e. Regarding claim 6, the apparatus further comprises parallel moving means for moving the holding means in parallel with the wiping surface of the wiper. See column 5, lines 29-48 in reference to displacement.

f. Regarding claims 7 and 8, the wiper comprises a resilient material which is porous and inherently provided with venting holes. See column 3, lines 43 and 44.

g. Regarding claim 10, the wiper is rotatably provided on a rotary axis. See column 3, lines 65-end to column 4, lines 1-4.

h. Regarding claims 11 and 14, the means for supplying electrolytic solution supplies electrolytic solution including an electrolyte and an additive which is polishing particles. See column 3, line 36, and lines 39 and 40.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doan(6,582,281) et al.

a. Doan et al is explained above.

b. Doan et al does not disclose a means for supplying which supplies an additive which contains copper ions or at least one element selected from the group consisting of a brightener and a chelating agent. However, Doan et al discloses that additives such as aqueous matter and salts can be included in an electrolytic solution for polishing a substrate. See column 3, lines 31-38.

c. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide any desired additive to the electrolytic solution which would aid in the polishing of a substrate.

11. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doan(6,582,281) et al in view of Taylor(6,558,231).

a. Doan et al is explained above.

b. Doan et al does not specifically disclose a power supply which supplies electrical current in the manner recited by applicant in claims 15-18(i.e., variable current).

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c. Taylor discloses that it is well known in the art to use a power supply which provides a variable electrical current in a process of electropolishing(electro-chemical machining) metals in order to provide for better polishing of a substrate. See abstract; column 5, lines 38-end to column 6, lines 1-13; and column 6, lines 38-62.

d. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Doan et al by providing a power supply capable of providing variable electrical current in view of the teachings of Taylor in order to enhance the electro-chemical machining of the substrate.

e. Regarding claims 17 and 18, the power supply as modified is capable of supplying current at any time during electro-chemical machining of the substrate.

12. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doan (6,582,281) et al in view of Shimomura(5,922,620) et al.

a. Doan et al is explained above.

b. Doan et al does not disclose temperature adjusting means for adjusting the temperature of the electrolytic solution supplied from the means for supplying electrolytic solution.

c. Shimomura et al disclose temperature adjusting means for adjusting the temperature of electrolytic solution supplied from a means for supplying electrolytic solution to 80°C or lower in

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order to optimize machining of a substrate. See column 8, lines 23-26.

d. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Doan et al apparatus by providing a temperature adjusting means for adjusting the temperature of the electrolytic solution supplied from the means for supplying electrolytic solution to 80°C or lower as taught by Shimomura et al in order to optimize machining of the substrate.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

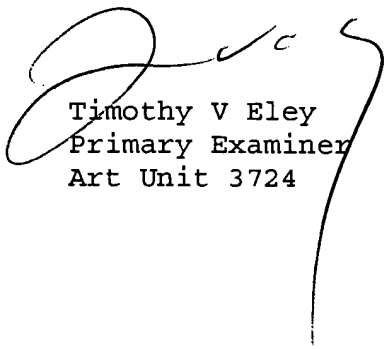
a. The cited prior art discloses apparatuses for electro-chemical machining substrates.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy V Eley whose telephone number is 703-308-1824. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Allan N Shoap can be reached on 703-308-1082. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Timothy V Eley
Primary Examiner
Art Unit 3724

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